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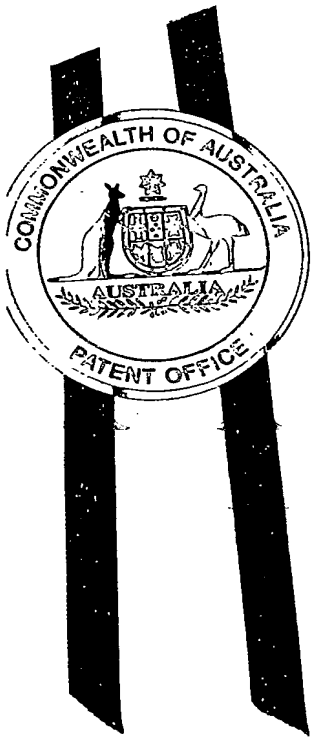

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LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
AND SALES

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PROVISIONAL SPECIFICATION

Invention Title: COATING APPARATUS AND METHOD

Applicant: HYDROCO (AUSTRALIA) PTY LTD

The invention is described in the following statement:

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COATING APPARATUS AND METHOD

The present invention relates to apparatus and methods for coating the human body. More particularly the present invention relates to apparatus and methods for applying cosmetic and therapeutic compositions on the human body.

BACKGROUND

Since ancient times humans have applied various compositions to their bodies for cosmetic and therapeutic purposes. Examples of compositions include moisturisers, sun protection lotions, artificial tanning compositions, pharmaceutical compositions and the like. These compositions have been traditionally applied by hand. It is also known in the art that some compositions may be applied with a spray device, such as sun protection lotions and artificial tanning substances.

A problem in the application of compositions to the skin is that the absorption of the active ingredient(s) in the compositions can be quite variable. This leads to difficulties in obtaining reproducible and consistent results. An easily visualised example of this problem can be seen in the application of artificial tanning compositions to the skin. It is a recognised problem in the field of artificial tanning that different parts of the body absorb the active ingredient in the tanning composition to varying extents, leading to a "patchy" and generally aesthetically unacceptable result.

The lack of reproducibility in the absorption of biologically active compounds is also a recognised problem in the field of transdermal pharmaceutical administration. It is difficult to standardise a dosage for a given active compound given the variability of absorption from one person to another. This problem may result in significantly different amounts of active being absorbed in two individuals. Accordingly, one person may be overdosed, while another may be underdosed.

There is therefore a clear need to provide an apparatus that is able to improve on the lack of uniform absorption of compositions on the skin.

Another problem that is especially prevalent in the field of artificial tanning is that many individuals feel uncomfortable about removing their clothing outside the security of their home. While spray-on tanning salons have been very popular, this is a significant problem for many users and a barrier to market expansion.

It is an aspect of the present invention to overcome or alleviate a problem of the prior art.

SUMMARY OF THE INVENTION

In one aspect, the present invention provides an apparatus for applying a composition to the skin, the apparatus including a chamber, the chamber including means for washing the skin, and means for applying the composition. Applicants have recognised that incorporating means for washing the skin into a chamber designed for applying a composition to the skin provides a number of advantages such as removal of foreign matter from the skin, and also removal of a proportion of the stratum corneum. Removal of these products from the skin immediately before the application of a composition improves the reproducibility of the absorption of the active ingredient in the composition.

A further major advantage is that the present invention lends itself to the easy incorporation of spray-on tanning technology into the home. An existing shower recess may be converted into a combined shower and tanning chamber.

In a preferred embodiment of the invention the means for washing the body is a shower head of the type often used in a domestic setting.

In a further preferred form of the invention the apparatus further includes means for steam generation. The effect of steam assists in the initial

cleansing process leading to more uniform absorption of the composition. Under these conditions, subcutaneous blood flow is stimulated leading to enhanced cleansing of the pores of the skin, as well as natural exfoliation.

The apparatus may further include means for evaporating moisture from the surface of the user. The means could be a fan capable of exhausting the humid air from the chamber leading to the ingress of drier air. This in turn leads to the evaporation of moisture from the skin of the user thereby cooling the skin. The constriction of capillaries and pores follows. This process better prepares the skin for application of the tanning composition.

In another aspect, the present invention provides a method of coating the skin with a composition, the method including the steps of entering a chamber including means for washing the skin, means for applying the composition, and means for removing effluent from the chamber, washing the skin using the means for washing the skin, and applying the composition to the skin using the means for applying the composition.

The present invention contemplates the use of many compositions, including but not limited to self-tanning formulations, sunscreens, suntan lotions, tanning accelerators, sunburn treatments, insect repellants, skin toners, skin bleaches, skin lighteners, anti-microbial compositions, moisturizers, exfoliants, nutriments or vitamins, massage aides, muscle relaxants, skin treatment agents, burn treatment agents, decontamination agents, cosmetics, wrinkle treatments or removers, scents and aromas.

Throughout the description and the claims of this specification the word "comprise" and variations of the word, such as "comprising" and "comprises" is not intended to exclude other additives, components, integers or steps.

The discussion of documents, acts, materials, devices, articles and the like is included in this specification solely for the purpose of providing a context for the present invention. It is not suggested or represented that any or all of these matters formed part of the prior art base or were common general

knowledge in the field relevant to the present invention as it existed in Australia before the priority date of each claim of this application.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a perspective view of an apparatus of the present invention. The embodiment shown is that of a domestic shower recess equipped with a plurality of spray heads designed to deliver composition.

Figure 2 shows a front cutaway view of a self-contained, wall-mounted embodiment of the invention.

Figure 3 shows a lateral view of the apparatus of Figure 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In one aspect, the present invention provides an apparatus for applying a composition to the skin, the apparatus including a chamber, the chamber including means for washing the skin, and means for applying the composition.

Applicants have recognised that incorporating means for washing the skin into a chamber designed for applying a composition to the skin provides a number of advantages. The skin of most people is covered in material such as moisturisers, cosmetics, deodorants, antiperspirants, fragrances, pollution, oils, salts, dead skin cells, bacteria and the like. These materials can form a barrier to the even deposition of compositions on the skin. Removal of these products from the skin immediately before the application of a composition improves the reproducibility of the absorption of the active ingredient in the composition. It has also been discovered that the application of steam to the skin before the application of artificial tanning compositions assists in the cleansing process leading to more even colouring.

Applicants have further recognised that washing the skin immediately before the application of a composition removes a proportion of the stratum corneum, the top most layer of skin that is thickened and generally impermeable to

active compounds. In the field of artificial tanning, the stratum corneum acts to preferentially absorb substances such as dihydroxyacetone. Therefore, if an effort is not made to remove a proportion of this skin layer, an uneven tan will result.

A further major advantage is that the present invention lends itself to the easy incorporation of spray-on tanning technology into the home. An existing shower recess may be converted into a combined shower and tanning chamber. Persons concerned with removing their clothing in a foreign environment are able to apply artificial tanning compositions and the like in the comfort and security of their own home.

In a preferred form of the invention the apparatus is a self-contained unit that can be attached to the wall and adapted to be connected to the existing plumbing in a shower recess, thereby taking the place of the existing shower. An embodiment of this form of the invention is shown in Figures 2 and 3. In one form of the invention the unit includes at least one reservoir for containing a composition such as an artificial tanning composition or moisturiser etc., the reservoir being connected to a pump which is in turn connected to a plurality of atomising nozzles directed into the shower recess. The unit may also include a "body shower" featuring a plurality of longitudinally disposed water jets. The water jets are supplied from the hot and cold mains water supply via a mixer valve. The unit may also contain a plurality of steam outlets supplied by the mains hot water, or a separate steam generating unit. Because the unit may completely take the place of the existing shower, the unit may also include a standard shower head. Typically, the self-contained unit will be about 1300mm high x 275mm wide and about 130mm deep.

This self-contained unit may have 6 to 12 tan spray nozzles that supply the tan solution from a reservoir and a pump that are mounted inside the cabinet. The pump can be manually operated without electrical connection or by electrical/low voltage, or battery. The delivery of composition may also be driven via an aerosol can that can be located inside cabinet. The aerosol can may contain the tan solution, or simply supply the gas propellant.

Another reservoir is allowed for, so that other solutions may be utilised – moisturisers, aromas, disinfectants and the like, again using all means for pumping and atomising methods including aerosol cans.

Steam or hot atomised water can be sprayed through 3 to 6 nozzles/outlets located on cabinet. A real steam generator may be installed inside the cabinet or remote from cabinet (nearby the shower room) or hot water may be atomised. A foot rest may be moulded in the front cabinet enclosure so that bather can rest leg in order to rub solutions into legs without excessive bending on the part of the user.

In an alternative form of the invention, the apparatus may be used in a commercial setting such as a tanning salon. In this case, it is likely that the apparatus would be a completely purpose-built device rather than an existing shower cubicle that has been retrofitted with means for applying the composition. It will be appreciated however, that such a purpose-built device could also be used in a domestic setting.

Turning to the drawing of Figure 1 there is represented one embodiment of the invention showing two walls 2 of the chamber, to which is attached a plurality spray heads 4 for applying the composition. A pump 6 supplies the composition under pressure to the spray heads 4 via conduits 8. The chamber also includes a shower head 10 that is supplied with mains pressure water via the taps 12. The floor of the chamber 14 is fitted with a drain 16 to remove effluent from the chamber.

The means for washing the body may be any means capable of depositing water or any other cleaning solution on the body such as a device that delivers water in the form of a jet or a spray. Preferably, the water is directed toward a central region of the chamber where the user would normally be positioned. More preferably, the water is directed or provided at a pressure such that the walls of the chamber are not exposed to a large amount of water. The skilled person will be familiar with a range of devices suitable for

use with the present invention. One such device is a "body shower" including a number of longitudinally disposed jets or sprays that act to direct water to the head, torso and leg region of the user. Another device that will be useful as a means for washing the body is a shower head of the type often used in a domestic setting. In another form of the invention the chamber includes means for removing effluent from the chamber such as a drain of the type often used in a domestic setting.

The means for applying the composition may be any means capable of depositing the composition on the body. Preferably the means for applying the composition relies on atomisation of the composition. The skilled person will be familiar with many means for atomising a composition including but not limited to the following: air atomisation, siphon feed, gravity feed, pressure feed, internal atomisation, external atomisation, low pressure low volume, high volume low pressure, airless atomisation, pressurized through small orifices, air-assisted, air-assisted heated, electrostatic, using charged particles, heated charged particles, high speed rotational atomizers, and ultrasonic.

The present invention also contemplates the use of other processes such as vaporization, misting and nebulization.

The means for applying the composition may be static, or may move. Alternatively, the person may be on a rotating platform during application of the composition. The means for applying the composition may be positioned in any area within the chamber so long as a sufficient and even coating of composition is capable of being applied to the desired area(s) of the body.

It should be understood that the means for washing the body and the means for applying the composition may be one and the same means.

In a preferred embodiment the chamber is a shower recess or shower cubicle commonly used in domestic bathrooms. The walls of the chamber may be solid, or may be a curtain, or a combination of both. Furthermore, the chamber may be any shape. The main function of the chamber is to minimise

the escape of water or composition or steam from the general environs of the user. The chamber does not necessarily need to completely surround the user, and may include only three sides for example. In one form of the invention the chamber is completely enclosed. Another function of the chamber is to prevent soiling of the surroundings with composition or water. This is especially important in the application of artificial tanning compositions since these compositions tend to stain.

In another aspect, the present invention provides an apparatus for applying a composition to the skin, the apparatus including a chamber, the chamber including means for generating steam and means for applying the composition. As used herein the term "steam" is intended to include water vapour produced by heating liquid water to about 100°C. The term is also intended to include water vapour produced by heating water to temperatures as low as about 40°C. Also included in the term "steam" is atomised hot water of between about 40°C to about 100°C. Most usually the hot water is atomised at a temperature of about 50°C to about 55°C. Other means for generating steam are well known, and the skilled person will be able to select other methods from those known in the sauna industry. The effect of steam assists in the initial cleansing process leading to more uniform absorption of the composition. Under these conditions, subcutaneous blood flow is stimulated leading to enhanced cleansing of the pores of the skin, as well as natural exfoliation. The steam may be activated for from about 2 minutes to about 7 minutes at between about 43°C to about 46°C.

It is further contemplated that the apparatus includes means for washing the body in conjunction with means for generating steam. This combination provides a surprising synergistic effect in effectiveness in absorption of the composition.

The apparatus may further include means for evaporating moisture from the surface of the user. The means could be a fan capable of exhausting the humid air from the chamber leading to the ingress of drier air. This in turn leads to the evaporation of moisture from the skin of the user thereby cooling

the skin. The constriction of capillaries and pores follows. This process better prepares the skin for application of the tanning composition.

In another aspect, the present invention provides a method of coating the skin with a composition, the method including the steps of entering a chamber including means for washing the skin, means for applying the composition, and means for removing effluent from the chamber, washing the skin using the means for washing the skin, and applying the composition to the skin using the means for applying the composition.

In a preferred form of the invention the washing step includes the use of an exfoliant. The exfoliant may be in the form of a mildly abrasive composition, or an implement such as a brush, coarse cloth or the like.

In a preferred form of the method the method includes the step of exposing the skin to which the composition is to be applied to steam. This assists in preparing the skin for the application of the composition. This step may occur at any stage of the process but is preferably after the washing step.

Another step that may be incorporated into the present method is the application of a moisturizer, either before or after the application of the tanning composition. This can be accomplished using the means for applying the composition in the chamber.

The present invention contemplates the use of many compositions, including but not limited to self-tanning formulations, sunscreens, suntan lotions, tanning accelerators, sunburn treatments, insect repellants, skin toners, skin bleaches, skin lighteners, anti-microbial compositions, moisturizers, exfoliants, nutriments or vitamins, massage aides, muscle relaxants, skin treatment agents, burn treatment agents, decontamination agents, cosmetics, wrinkle treatments or removers, scents or aromas. In a preferred embodiment of the invention the composition is an artificial tanning composition.

By way of more specific examples many artificial tanning compositions are known in the art and include active ingredients that do not chemically alter the skin (e.g. bronzers) as well as those that chemically interact with the skin (e.g. dihydroxyacetone). Examples of artificial tanning compositions suitable for use in the context of the present invention follow:

Composition 1

Ingredient	%
Dihydroxyacetone	3
Water	97

Composition 2

Ingredient	%
Dihydroxyacetone	3.0
Denatured Ethanol	20.0
Water	77.0

Composition 3

Ingredient	%
Dihydroxyacetone	12.0
Denature Ethanol	20.0
Water	68.0

Composition 4

Ingredient	%
Dihydroxyacetone	10.0
Commercial Sunless Tanning Lotion	15.0
Water	75.0

Composition 5

Ingredient	%
Dihydroxyacetone	9.0
Commercial moisturizer	20.0
Citric acid	0.3
Commercial bath product	0.6
Bronzer	6.0
Water	64.1

Other colourants may also be used, such as crotonaldehyde, pyruvaldehyde, glycolaldehyde, glutaraldehyde, ortho-phthaldehyde, sorbose, fructose, erythrulose, methylvinylketone, or food coloring.

By way of example, a suitable commercial moisturizer would include Vaseline Brand Intensive Care Aloe and Naturals lotion (Chesebrough-Ponds, Greenwich, Conn.), and a suitable commercial bath product would include Vaseline Brand Intensive Care Foaming Creme Bath (Chesebrough-Ponds, Greenwich, Conn.). The bronzer is a combination of FD&C dyes that yield a golden brown color.

By way of further example, a bronzer composition useful in the context of the present invention follows:

Composition 6

Ingredient	%
Bronzer	8.0
Commercial moisturizer	20.0
Commercial bath product	0.6
Ethoxydiglycol	2.0
Water	69.4

By way of example, a suitable commercial moisturizer would include Vaseline Brand Intensive Care Aloe and Naturals lotion (Chesebrough-Ponds, Greenwich, Conn.), and a suitable commercial bath product would include Vaseline Brand Intensive Care Foaming Creme Bath (Chesebrough-Ponds, Greenwich, Conn.). The bronzer is a combination of FD&C dyes that yield a golden brown color. Other colourants such as lawsone and juglone may be used.

By way of further example, suitable commercial preparations useful in the context of the present invention include Coppertone®. Oil-Free Sunless Tanner (Schering-Plough, Memphis, Tenn.), Neutrogena®. Glow Sunless Tanning Lotion for Face and Body (Neutrogena, Los Angeles, Calif.), and Kroger®. Sunless Tanning Cream (Kroger, Cincinnati, Ohio).

The compositions may be in any form, for example a solution, a slurry, a suspension, a colloidal suspension, an oil in water emulsion, a water in oil emulsion, and the like. The skilled person will be able to establish the best

means for applying any given composition according to the present invention. For example, it will be immediately apparent that compositions having a more viscous consistency will be more difficult to atomise by passing the composition through an orifice. Accordingly, the spray head may require an aperture of a larger diameter, or a pump capable of supplying the composition to the aperture at a higher pressure in order to overcome the natural tendency of a viscous liquid to occlude the aperture.

Finally, it is to be understood that various other modification and/or alterations may be made without departing from the spirit of the present invention as outlined herein.

Dated: 21 November 2003
PHILLIPS ORMONDE & FITZPATRICK
Attorneys for:
HYDROCO (AUSTRALIA) PTY LTD

FIGURE 1

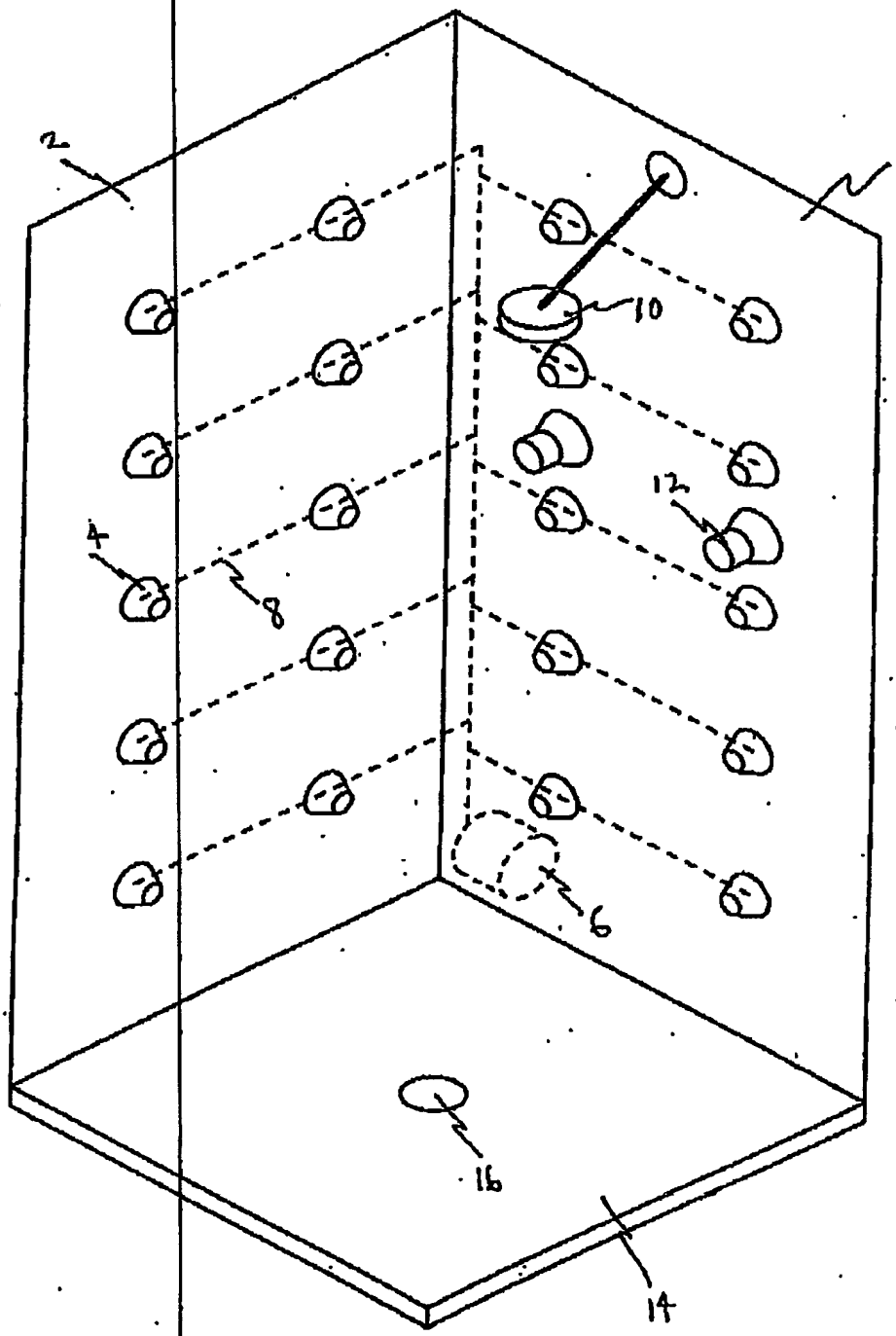


FIGURE 2

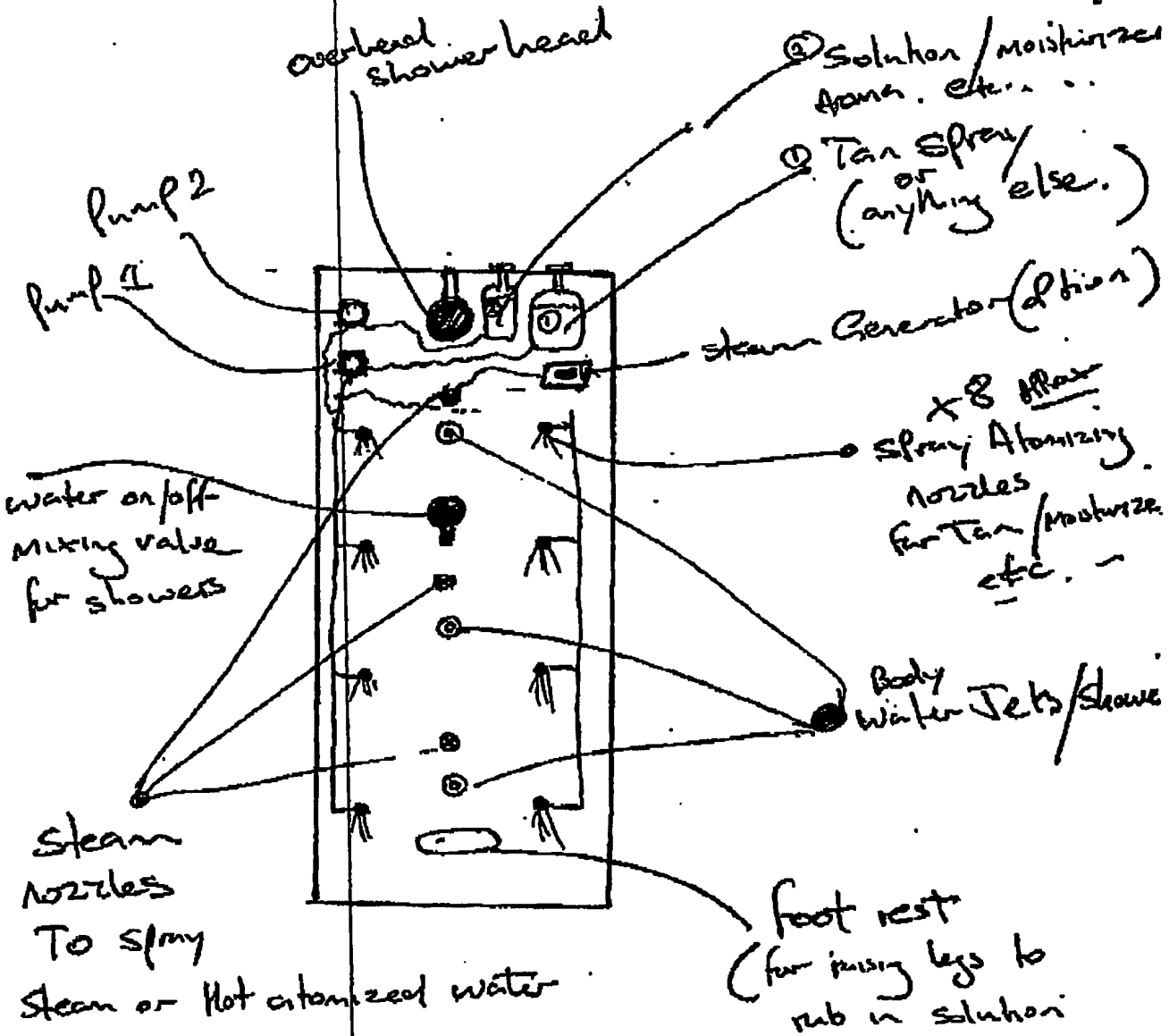
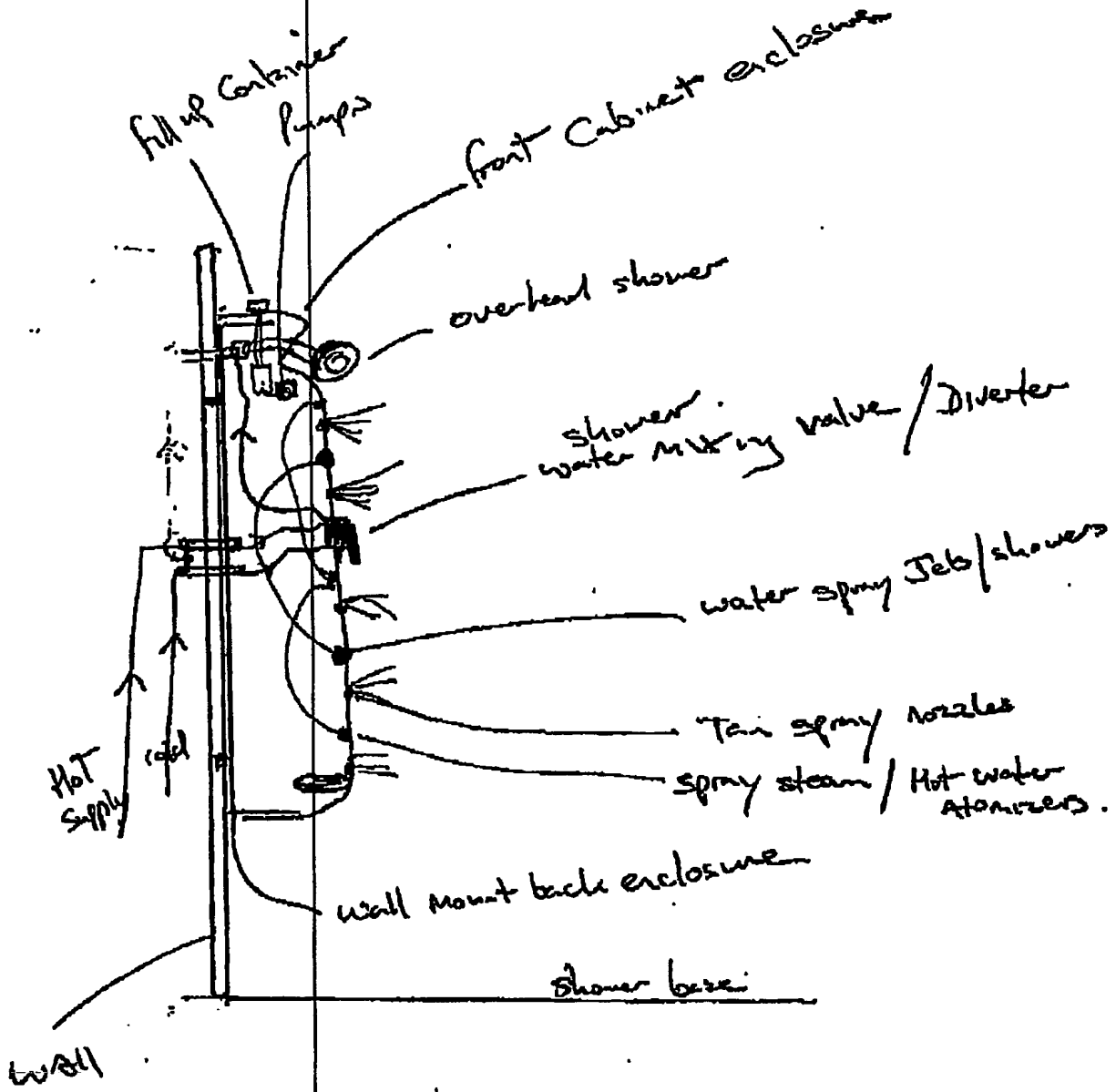

overhead shower head
Solution / moisturizer
Tan Spray / or (anything else.)
Pump 2
Pump 1
steam Generator (Option)
x8 approx
Spray Atomizing nozzles for Tan / moisturize etc.
water on/off Mixing valve for showers
Body water Jets/Shower
steam nozzles To spray steam or Hot atomized water
foot rest (for rinsing legs to rub in solution

FIGURE 3



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